

SEQUENCE LISTING

<110> Wilson, James M.
Xiao, Weidong

<120> Adeno-Associated Virus Serotype I Nucleic Acid Sequences,
Vectors and Host Cells Containing Same

<130> GNVPN.031USA

<140> US 09/807,802

<141> 2001-04-17

<150> US 60/107,114

<151> 1998-11-05

<150> PCT/US99/25694

<151> 1999-11-02

<160> 20

<170> PatentIn version 3.1

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Ile	Val	Thr	Ser	Asn	Thr	Asn	Met	Cys	Ala	Val	Ile	Asp	Gly	Asn	Ser		
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Thr	Thr	Phe	Glu	His	Gln	Gln	Pro	Leu	Gln	Asp	Arg	Met	Phe	Lys	Phe		
		435					440					445					
Glu	Leu	Thr	Arg	Arg	Leu	Glu	His	Asp	Phe	Gly	Lys	Val	Thr	Lys	Gln		
	450					455					460						
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Ala	His	Glu	Phe	Tyr	Val	Arg	Lys	Gly	Gly	Ala	Asn	Lys	Arg	Pro	Ala		
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Pro	Asp	Asp	Ala	Asp	Lys	Ser	Glu	Pro	Lys	Arg	Ala	Cys	Pro	Ser	Val		
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Ala	Asp	Pro	Ser	Thr	Ser	Asp	Ala	Glu	Gly	Ala	Pro	Val	Asp	Phe	Ala		
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Asp	Arg	Tyr	Gln	Asn	Lys	Cys	Ser	Arg	His	Ala	Gly	Met	Leu	Gln	Met		
	530					535					540						
Leu	Phe	Pro	Cys	Lys	Thr	Cys	Glu	Arg	Met	Asn	Gln	Asn	Phe	Asn	Ile		
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Cys	Phe	Thr	His	Gly	Thr	Arg	Asp	Cys	Ser	Glu	Cys	Phe	Pro	Gly	Val		
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Ala	Ile	His	His	Leu	Leu	Gly	Arg	Ala	Pro	Glu	Ile	Ala	Cys	Ser	Ala		
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Lys	Ala	Asn	Gln	Gln	Lys	Gln	Asp	Asp	Gly	Arg	Gly	Leu	Val	Leu	Pro	
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Gly	Tyr	Lys	Tyr	Leu	Gly	Pro	Phe	Asn	Gly	Leu	Asp	Lys	Gly	Glu	Pro	
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Val	Asn	Ala	Ala	Asp	Ala	Ala	Ala	Leu	Glu	His	Asp	Lys	Ala	Tyr	Asp	
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Gln	Gln	Leu	Lys	Ala	Gly	Asp	Asn	Pro	Tyr	Leu	Arg	Tyr	Asn	His	Ala	
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Asp	Ala	Glu	Phe	Gln	Glu	Arg	Leu	Gln	Glu	Asp	Thr	Ser	Phe	Gly	Gly	
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Asn	Leu	Gly	Arg	Ala	Val	Phe	Gln	Ala	Lys	Lys	Arg	Val	Leu	Glu	Pro	
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Leu	Gly	Leu	Val	Glu	Glu	Gly	Ala	Lys	Thr	Ala	Pro	Gly	Lys	Lys	Arg	
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Pro	Val	Glu	Gln	Ser	Pro	Gln	Glu	Pro	Asp	Ser	Ser	Ser	Gly	Ile	Gly	
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Lys	Thr	Gly	Gln	Gln	Pro	Ala	Lys	Lys	Arg	Leu	Asn	Phe	Gly	Gln	Thr	
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Gly	Asp	Ser	Glu	Ser	Val	Pro	Asp	Pro	Gln	Pro	Leu	Gly	Glu	Pro	Pro	
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Ala	Thr	Pro	Ala	Ala	Val	Gly	Pro	Thr	Thr	Met	Ala	Ser	Gly	Gly	Gly	
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Ala	Pro	Met	Ala	Asp	Asn	Asn	Glu	Gly	Ala	Asp	Gly	Val	Gly	Asn	Ala	
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Ser	Gly	Asn	Trp	His	Cys	Asp	Ser	Thr	Trp	Leu	Gly	Asp	Arg	Val	Ile	
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Thr	Thr	Ser	Thr	Arg	Thr	Trp	Ala	Leu	Pro	Thr	Tyr	Asn	Asn	His	Leu	
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Tyr	Lys	Gln	Ile	Ser	Ser	Ala	Ser	Thr	Gly	Ala	Ser	Asn	Asp	Asn	His	
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Tyr	Phe	Gly	Tyr	Ser	Thr	Pro	Trp	Gly	Tyr	Phe	Asp	Phe	Asn	Arg	Phe	
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His	Cys	His	Phe	Ser	Pro	Arg	Asp	Trp	Gln	Arg	Leu	Ile	Asn	Asn	Asn	
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Trp	Gly	Phe	Arg	Pro	Lys	Arg	Leu	Asn	Phe	Lys	Leu	Phe	Asn	Ile	Gln	

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Leu	Thr	Ser	Thr	Val	Gln	Val	Phe	Ser	Asp	Ser	Glu	Tyr	Gln	Leu	Pro
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Tyr	Val	Leu	Gly	Ser	Ala	His	Gln	Gly	Cys	Leu	Pro	Pro	Phe	Pro	Ala
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Asp	Val	Phe	Met	Ile	Pro	Gln	Tyr	Gly	Tyr	Leu	Thr	Leu	Asn	Asn	Gly
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Ser	Gln	Ala	Val	Gly	Arg	Ser	Ser	Phe	Tyr	Cys	Leu	Glu	Tyr	Phe	Pro
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Ser	Gln	Met	Leu	Arg	Thr	Gly	Asn	Asn	Phe	Thr	Phe	Ser	Tyr	Thr	Phe
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Glu	Glu	Val	Pro	Phe	His	Ser	Ser	Tyr	Ala	His	Ser	Gln	Ser	Leu	Asp
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Arg	Leu	Met	Asn	Pro	Leu	Ile	Asp	Gln	Tyr	Leu	Tyr	Tyr	Leu	Asn	Arg
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Gly	Pro	Cys	Tyr	Arg	Gln	Gln	Arg	Val	Ser	Lys	Thr	Lys	Thr	Asp	Asn
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Asn	Asn	Ser	Asn	Phe	Thr	Trp	Thr	Gly	Ala	Ser	Lys	Tyr	Asn	Leu	Asn
			500					505					510		
Gly	Arg	Glu	Ser	Ile	Ile	Asn	Pro	Gly	Thr	Ala	Met	Ala	Ser	His	Lys
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Asp	Asp	Glu	Asp	Lys	Phe	Phe	Pro	Met	Ser	Gly	Val	Met	Ile	Phe	Gly
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Lys	Glu	Ser	Ala	Gly	Ala	Ser	Asn	Thr	Ala	Leu	Asp	Asn	Val	Met	Ile
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Thr	Asp	Glu	Glu	Glu	Ile	Lys	Ala	Thr	Asn	Pro	Val	Ala	Thr	Glu	Arg
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Phe	Gly	Thr	Val	Ala	Val	Asn	Phe	Gln	Ser	Ser	Ser	Thr	Asp	Pro	Ala
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Thr	Gly	Asp	Val	His	Ala	Met	Gly	Ala	Leu	Pro	Gly	Met	Val	Trp	Gln
		595					600					605			
Asp	Arg	Asp	Val	Tyr	Leu	Gln	Gly	Pro	Ile	Trp	Ala	Lys	Ile	Pro	His
	610					615					620				
Thr	Asp	Gly	His	Phe	His	Pro	Ser	Pro	Leu	Met	Gly	Gly	Phe	Gly	Leu

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Lys Asn Pro Pro	Pro Gln Ile Leu Ile	Lys Asn Thr Pro Val	Pro Ala			
	645	650	655			
Asn Pro Pro Ala	Glu Phe Ser Ala Thr	Lys Phe Ala Ser Phe	Ile Thr			
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Gln Tyr Ser Thr	Gly Gln Val Ser Val	Glu Ile Glu Trp	Glu Leu Gln			
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Lys Glu Asn Ser	Lys Arg Trp Asn Pro	Glu Val Gln Tyr Thr	Ser Asn			
	690	695	700			
Tyr Ala Lys Ser	Ala Asn Val Asp Phe Thr	Val Asp Asn Asn Gly	Leu			
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Glu His Leu Pro Gly Ile Ser Asp Ser Phe Val Ser Trp Val Ala Glu	
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Lys Glu Trp Glu Leu Pro Pro Asp Ser Asp Met Asp Leu Asn Leu Ile	
35 40 45	
gag cag gca ccc ctg acc gtg gcc gag aag ctg cag cgc gac ttc ctg	192
Glu Gln Ala Pro Leu Thr Val Ala Glu Lys Leu Gln Arg Asp Phe Leu	
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Val Gln Trp Arg Arg Val Ser Lys Ala Pro Glu Ala Leu Phe Phe Val	
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Gln Phe Glu Lys Gly Glu Ser Tyr Phe His Leu His Ile Leu Val Glu	
85 90 95	
acc acg ggg gtc aaa tcc atg gtg ctg ggc cgc ttc ctg agt cag att	336
Thr Thr Gly Val Lys Ser Met Val Leu Gly Arg Phe Leu Ser Gln Ile	
100 105 110	

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ctg acc cac gtc agc cag acc cag gag cag aac aag gag aat ctg aac Leu Thr His Val Ser Gln Thr Gln Glu Gln Asn Lys Glu Asn Leu Asn 195 200 205	624
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Cys Val Asp Lys Met Val Ile Trp Trp Glu Glu Gly Lys Met Thr Ala	
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Lys Val Val Glu Ser Ala Lys Ala Ile Leu Gly Gly Ser Lys Val Arg	
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Val Asp Gln Lys Cys Lys Ser Ser Ala Gln Ile Asp Pro Thr Pro Val	
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Ile Val Thr Ser Asn Thr Asn Met Cys Ala Val Ile Asp Gly Asn Ser	
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Thr Thr Phe Glu His Gln Gln Pro Leu Gln Asp Arg Met Phe Lys Phe	
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Ala His Glu Phe Tyr Val Arg Lys Gly Gly Ala Asn Lys Arg Pro Ala	
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Leu Phe Pro Cys Lys Thr Cys Glu Arg Met Asn Gln Asn Phe Asn Ile	
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Cys Phe Thr His Gly Thr Arg Asp Cys Ser Glu Cys Phe Pro Gly Val	
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Ser Glu Ser Gln Pro Val Val Arg Lys Arg Thr Tyr Arg Lys Leu Cys	
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Gln	Lys	Arg	Phe	Gly	Lys	Arg	Asn	Thr	Ile	Trp	Leu	Phe	Gly	Pro	Ala	
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Thr	Thr	Gly	Lys	Thr	Asn	Ile	Ala	Glu	Ala	Ile	Ala	His	Ala	Val	Pro	
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Phe	Tyr	Gly	Cys	Val	Asn	Trp	Thr	Asn	Glu	Asn	Phe	Pro	Phe	Asn	Asp	
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Cys	Val	Asp	Lys	Met	Val	Ile	Trp	Trp	Glu	Glu	Gly	Lys	Met	Thr	Ala	
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ctg Leu	acc Thr	cac His 195	gtc Val	agc Ser	cag Gln	acc Thr	cag Gln 200	gag Glu	cag Gln	aac Asn	aag Lys	gag Glu 205	aat Asn	ctg Leu	aac Asn	624
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Ile Val Thr Ser Asn Thr Asn Met Cys Ala Val Ile Asp Gly Asn Ser	
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Pro Asp Asp Ala Asp Lys Ser Glu Pro Lys Arg Ala Cys Pro Ser Val	
500 505 510	
gcg gat cca tcg acg tca gac gcg gaa gga gct ccg gtg gac ttt gcc	1584
Ala Asp Pro Ser Thr Ser Asp Ala Glu Gly Ala Pro Val Asp Phe Ala	
515 520 525	
gac agg tat ggc tgc cga tgg tta tct tcc aga ttg gct cga gga caa	1632
Asp Arg Tyr Gly Cys Arg Trp Leu Ser Ser Arg Leu Ala Arg Gly Gln	
530 535 540	
cct ctc tga	1641
Pro Leu	
545	

<210> 7
 <211> 546
 <212> PRT
 <213> AAV-1

<400> 7
 Met Pro Gly Phe Tyr Glu Ile Val Ile Lys Val Pro Ser Asp Leu Asp
 1 5 10 15
 Glu His Leu Pro Gly Ile Ser Asp Ser Phe Val Ser Trp Val Ala Glu
 20 25 30
 Lys Glu Trp Glu Leu Pro Pro Asp Ser Asp Met Asp Leu Asn Leu Ile
 35 40 45

Glu	Gln	Ala	Pro	Leu	Thr	Val	Ala	Glu	Lys	Leu	Gln	Arg	Asp	Phe	Leu	
50						55					60					
Val	Gln	Trp	Arg	Arg	Val	Ser	Lys	Ala	Pro	Glu	Ala	Leu	Phe	Phe	Val	
65					70					75					80	
Gln	Phe	Glu	Lys	Gly	Glu	Ser	Tyr	Phe	His	Leu	His	Ile	Leu	Val	Glu	
				85					90					95		
Thr	Thr	Gly	Val	Lys	Ser	Met	Val	Leu	Gly	Arg	Phe	Leu	Ser	Gln	Ile	
			100					105					110			
Arg	Asp	Lys	Leu	Val	Gln	Thr	Ile	Tyr	Arg	Gly	Ile	Glu	Pro	Thr	Leu	
		115					120					125				
Pro	Asn	Trp	Phe	Ala	Val	Thr	Lys	Thr	Arg	Asn	Gly	Ala	Gly	Gly	Gly	
		130					135				140					
Asn	Lys	Val	Val	Asp	Glu	Cys	Tyr	Ile	Pro	Asn	Tyr	Leu	Leu	Pro	Lys	
145					150					155					160	
Thr	Gln	Pro	Glu	Leu	Gln	Trp	Ala	Trp	Thr	Asn	Met	Glu	Glu	Tyr	Ile	
				165					170					175		
Ser	Ala	Cys	Leu	Asn	Leu	Ala	Glu	Arg	Lys	Arg	Leu	Val	Ala	Gln	His	
			180					185					190			
Leu	Thr	His	Val	Ser	Gln	Thr	Gln	Glu	Gln	Asn	Lys	Glu	Asn	Leu	Asn	
			195				200					205				
Pro	Asn	Ser	Asp	Ala	Pro	Val	Ile	Arg	Ser	Lys	Thr	Ser	Ala	Arg	Tyr	
						215					220					
Met	Glu	Leu	Val	Gly	Trp	Leu	Val	Asp	Arg	Gly	Ile	Thr	Ser	Glu	Lys	
225					230					235					240	
Gln	Trp	Ile	Gln	Glu	Asp	Gln	Ala	Ser	Tyr	Ile	Ser	Phe	Asn	Ala	Ala	
				245					250					255		
Ser	Asn	Ser	Arg	Ser	Gln	Ile	Lys	Ala	Ala	Leu	Asp	Asn	Ala	Gly	Lys	
			260					265					270			
Ile	Met	Ala	Leu	Thr	Lys	Ser	Ala	Pro	Asp	Tyr	Leu	Val	Gly	Pro	Ala	
			275				280					285				
Pro	Pro	Ala	Asp	Ile	Lys	Thr	Asn	Arg	Ile	Tyr	Arg	Ile	Leu	Glu	Leu	
						295					300					
Asn	Gly	Tyr	Glu	Pro	Ala	Tyr	Ala	Gly	Ser	Val	Phe	Leu	Gly	Trp	Ala	
305					310					315					320	
Gln	Lys	Arg	Phe	Gly	Lys	Arg	Asn	Thr	Ile	Trp	Leu	Phe	Gly	Pro	Ala	
				325					330					335		
Thr	Thr	Gly	Lys	Thr	Asn	Ile	Ala	Glu	Ala	Ile	Ala	His	Ala	Val	Pro	
			340					345					350			
Phe	Tyr	Gly	Cys	Val	Asn	Trp	Thr	Asn	Glu	Asn	Phe	Pro	Phe	Asn	Asp	
		355					360					365				

Cys Val Asp Lys Met Val Ile Trp Trp Glu Glu Gly Lys Met Thr Ala
 370 375 380
 Lys Val Val Glu Ser Ala Lys Ala Ile Leu Gly Gly Ser Lys Val Arg
 385 390 395 400
 Val Asp Gln Lys Cys Lys Ser Ser Ala Gln Ile Asp Pro Thr Pro Val
 405 410 415
 Ile Val Thr Ser Asn Thr Asn Met Cys Ala Val Ile Asp Gly Asn Ser
 420 425 430
 Thr Thr Phe Glu His Gln Gln Pro Leu Gln Asp Arg Met Phe Lys Phe
 435 440 445
 Glu Leu Thr Arg Arg Leu Glu His Asp Phe Gly Lys Val Thr Lys Gln
 450 455 460
 Glu Val Lys Glu Phe Phe Arg Trp Ala Gln Asp His Val Thr Glu Val
 465 470 475 480
 Ala His Glu Phe Tyr Val Arg Lys Gly Gly Ala Asn Lys Arg Pro Ala
 485 490 495
 Pro Asp Asp Ala Asp Lys Ser Glu Pro Lys Arg Ala Cys Pro Ser Val
 500 505 510
 Ala Asp Pro Ser Thr Ser Asp Ala Glu Gly Ala Pro Val Asp Phe Ala
 515 520 525
 Asp Arg Tyr Gly Cys Arg Trp Leu Ser Ser Arg Leu Ala Arg Gly Gln
 530 535 540
 Pro Leu
 545

<210> 8
 <211> 1200
 <212> DNA
 <213> AAV-1

<220>
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 <222> (1)..(1197)
 <223>

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 atg gag ctg gtc ggg tgg ctg gtg gac cgg ggc atc acc tcc gag aag 48
 Met Glu Leu Val Gly Trp Leu Val Asp Arg Gly Ile Thr Ser Glu Lys
 1 5 10 15
 cag tgg atc cag gag gac cag gcc tcg tac atc tcc ttc aac gcc gct 96
 Gln Trp Ile Gln Glu Asp Gln Ala Ser Tyr Ile Ser Phe Asn Ala Ala
 20 25 30
 tcc aac tcg cgg tcc cag atc aag gcc gct ctg gac aat gcc ggc aag 144
 Ser Asn Ser Arg Ser Gln Ile Lys Ala Ala Leu Asp Asn Ala Gly Lys
 35 40 45

atc atg gcg ctg acc aaa tcc gcg ccc gac tac ctg gta ggc ccc gct Ile Met Ala Leu Thr Lys Ser Ala Pro Asp Tyr Leu Val Gly Pro Ala 50 55 60	192
ccg ccc gcg gac att aaa acc aac cgc atc tac cgc atc ctg gag ctg Pro Pro Ala Asp Ile Lys Thr Asn Arg Ile Tyr Arg Ile Leu Glu Leu 65 70 75 80	240
aac ggc tac gaa cct gcc tac gcc ggc tcc gtc ttt ctc ggc tgg gcc Asn Gly Tyr Glu Pro Ala Tyr Ala Gly Ser Val Phe Leu Gly Trp Ala 85 90 95	288
cag aaa agg ttc ggg aag cgc aac acc atc tgg ctg ttt ggg ccg gcc Gln Lys Arg Phe Gly Lys Arg Asn Thr Ile Trp Leu Phe Gly Pro Ala 100 105 110	336
acc acg ggc aag acc aac atc gcg gaa gcc atc gcc cac gcc gtg ccc Thr Thr Gly Lys Thr Asn Ile Ala Glu Ala Ile Ala His Ala Val Pro 115 120 125	384
ttc tac ggc tgc gtc aac tgg acc aat gag aac ttt ccc ttc aat gat Phe Tyr Gly Cys Val Asn Thr Asn Glu Asn Phe Pro Phe Asn Asp 130 135 140	432
tgc gtc gac aag atg gtg atc tgg tgg gag gag ggc aag atg acg gcc Cys Val Asp Lys Met Val Ile Trp Trp Glu Glu Gly Lys Met Thr Ala 145 150 155 160	480
aag gtc gtg gag tcc gcc aag gcc att ctc ggc ggc agc aag gtg cgc Lys Val Val Glu Ser Ala Lys Ala Ile Leu Gly Gly Ser Lys Val Arg 165 170 175	528
gtg gac caa aag tgc aag tcg tcc gcc cag atc gac ccc acc ccc gtg Val Asp Gln Lys Cys Lys Ser Ser Ala Gln Ile Asp Pro Thr Pro Val 180 185 190	576
atc gtc acc tcc aac acc aac atg tgc gcc gtg att gac ggg aac agc Ile Val Thr Ser Asn Thr Asn Met Cys Ala Val Ile Asp Gly Asn Ser 195 200 205	624
acc acc ttc gag cac cag cag ccg ttg cag gac cgg atg ttc aaa ttt Thr Thr Phe Glu His Gln Gln Pro Leu Gln Asp Arg Met Phe Lys Phe 210 215 220	672
gaa ctc acc cgc cgt ctg gag cat gac ttt ggc aag gtg aca aag cag Glu Leu Thr Arg Arg Leu Glu His Asp Phe Gly Lys Val Thr Lys Gln 225 230 235 240	720
gaa gtc aaa gag ttc ttc cgc tgg gcg cag gat cac gtg acc gag gtg Glu Val Lys Glu Phe Phe Arg Trp Ala Gln Asp His Val Thr Glu Val 245 250 255	768
gcg cat gag ttc tac gtc aga aag ggt gga gcc aac aaa aga ccc gcc Ala His Glu Phe Tyr Val Arg Lys Gly Ala Asn Lys Arg Pro Ala 260 265 270	816
ccc gat gac gcg gat aaa agc gag ccc aag cgg gcc tgc ccc tca gtc Pro Asp Asp Ala Asp Lys Ser Glu Pro Lys Arg Ala Cys Pro Ser Val 275 280 285	864

gcg gat cca tcg acg tca gac gcg gaa gga gct ccg gtg gac ttt gcc	912
Ala Asp Pro Ser Thr Ser Asp Ala Glu Gly Ala Pro Val Asp Phe Ala	
290 295 300	

gac agg tac caa aac aaa tgt tct cgt cac gcg ggc atg ctt cag atg	960
Asp Arg Tyr Gln Asn Lys Cys Ser Arg His Ala Gly Met Leu Gln Met	
305 310 315 320	

ctg ttt ccc tgc aag aca tgc gag aga atg aat cag aat ttc aac att	1008
Leu Phe Pro Cys Lys Thr Cys Glu Arg Met Asn Gln Asn Phe Asn Ile	
325 330 335	

tgc ttc acg cac ggg acg aga gac tgt tca gag tgc ttc ccc ggc gtg	1056
Cys Phe Thr His Gly Thr Arg Asp Cys Ser Glu Cys Phe Pro Gly Val	
340 345 350	

tca gaa tct caa ccg gtc gtc aga aag agg acg tat cgg aaa ctc tgt	1104
Ser Glu Ser Gln Pro Val Val Arg Lys Arg Thr Tyr Arg Lys Leu Cys	
355 360 365	

gcc att cat cat ctg ctg ggg cgg gct ccc gag att gct tgc tcg gcc	1152
Ala Ile His His Leu Leu Gly Arg Ala Pro Glu Ile Ala Cys Ser Ala	
370 375 380	

tgc gat ctg gtc aac gtg gac ctg gat gac tgt gtt tct gag caa taa	1200
Cys Asp Leu Val Asn Val Asp Leu Asp Asp Cys Val Ser Glu Gln	
385 390 395	

<210> 9
 <211> 399
 <212> PRT
 <213> AAV-1

<400> 9	
Met Glu Leu Val Gly Trp Leu Val Asp Arg Gly Ile Thr Ser Glu Lys	
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Gln Trp Ile Gln Glu Asp Gln Ala Ser Tyr Ile Ser Phe Asn Ala Ala	
20 25 30	
Ser Asn Ser Arg Ser Gln Ile Lys Ala Ala Leu Asp Asn Ala Gly Lys	
35 40 45	
Ile Met Ala Leu Thr Lys Ser Ala Pro Asp Tyr Leu Val Gly Pro Ala	
50 55 60	
Pro Pro Ala Asp Ile Lys Thr Asn Arg Ile Tyr Arg Ile Leu Glu Leu	
65 70 75 80	
Asn Gly Tyr Glu Pro Ala Tyr Ala Gly Ser Val Phe Leu Gly Trp Ala	
85 90 95	
Gln Lys Arg Phe Gly Lys Arg Asn Thr Ile Trp Leu Phe Gly Pro Ala	
100 105 110	
Thr Thr Gly Lys Thr Asn Ile Ala Glu Ala Ile Ala His Ala Val Pro	
115 120 125	
Phe Tyr Gly Cys Val Asn Trp Thr Asn Glu Asn Phe Pro Phe Asn Asp	

130	135	140
Cys Val Asp Lys Met Val Ile Trp Trp Glu Glu Gly Lys Met Thr Ala 145 150 155 160		
Lys Val Val Glu Ser Ala Lys Ala Ile Leu Gly Gly Ser Lys Val Arg 165 170 175		
Val Asp Gln Lys Cys Lys Ser Ser Ala Gln Ile Asp Pro Thr Pro Val 180 185 190		
Ile Val Thr Ser Asn Thr Asn Met Cys Ala Val Ile Asp Gly Asn Ser 195 200 205		
Thr Thr Phe Glu His Gln Gln Pro Leu Gln Asp Arg Met Phe Lys Phe 210 215 220		
Glu Leu Thr Arg Arg Leu Glu His Asp Phe Gly Lys Val Thr Lys Gln 225 230 235 240		
Glu Val Lys Glu Phe Phe Arg Trp Ala Gln Asp His Val Thr Glu Val 245 250 255		
Ala His Glu Phe Tyr Val Arg Lys Gly Gly Ala Asn Lys Arg Pro Ala 260 265 270		
Pro Asp Asp Ala Asp Lys Ser Glu Pro Lys Arg Ala Cys Pro Ser Val 275 280 285		
Ala Asp Pro Ser Thr Ser Asp Ala Glu Gly Ala Pro Val Asp Phe Ala 290 295 300		
Asp Arg Tyr Gln Asn Lys Cys Ser Arg His Ala Gly Met Leu Gln Met 305 310 315 320		
Leu Phe Pro Cys Lys Thr Cys Glu Arg Met Asn Gln Asn Phe Asn Ile 325 330 335		
Cys Phe Thr His Gly Thr Arg Asp Cys Ser Glu Cys Phe Pro Gly Val 340 345 350		
Ser Glu Ser Gln Pro Val Val Arg Lys Arg Thr Tyr Arg Lys Leu Cys 355 360 365		
Ala Ile His His Leu Leu Gly Arg Ala Pro Glu Ile Ala Cys Ser Ala 370 375 380		
Cys Asp Leu Val Asn Val Asp Leu Asp Asp Cys Val Ser Glu Gln 385 390 395		

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 <211> 969
 <212> DNA
 <213> AAV-1

<220>
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 <222> (1)..(966)
 <223>

<220>
 <221> misc_feature
 <222> (943)..(944)
 <223> minor splice site

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 atg gag ctg gtc ggg tgg ctg gtg gac cgg ggc atc acc tcc gag aag 48
 Met Glu Leu Val Gly Trp Leu Val Asp Arg Gly Ile Thr Ser Glu Lys
 1 5 10 15
 cag tgg atc cag gag gac cag gcc tcg tac atc tcc ttc aac gcc gct 96
 Gln Trp Ile Gln Glu Asp Gln Ala Ser Tyr Ile Ser Phe Asn Ala Ala
 20 25 30
 tcc aac tcg cgg tcc cag atc aag gcc gct ctg gac aat gcc ggc aag 144
 Ser Asn Ser Arg Ser Gln Ile Lys Ala Ala Leu Asp Asn Ala Gly Lys
 35 40 45
 atc atg gcg ctg acc aaa tcc gcg ccc gac tac ctg gta ggc ccc gct 192
 Ile Met Ala Leu Thr Lys Ser Ala Pro Asp Tyr Leu Val Gly Pro Ala
 50 55 60
 ccg ccc gcg gac att aaa acc aac cgc atc tac cgc atc ctg gag ctg 240
 Pro Pro Ala Asp Ile Lys Thr Asn Arg Ile Tyr Arg Ile Leu Glu Leu
 65 70 75 80
 aac ggc tac gaa cct gcc tac gcc ggc tcc gtc ttt ctc ggc tgg gcc 288
 Asn Gly Tyr Glu Pro Ala Tyr Ala Gly Ser Val Phe Leu Gly Trp Ala
 85 90 95
 cag aaa agg ttc ggg aag cgc aac acc atc tgg ctg ttt ggg ccg gcc 336
 Gln Lys Arg Phe Gly Lys Arg Asn Thr Ile Trp Leu Phe Gly Pro Ala
 100 105 110
 acc acg ggc aag acc aac atc gcg gaa gcc atc gcc cac gcc gtg ccc 384
 Thr Thr Gly Lys Thr Asn Ile Ala Glu Ala Ile Ala His Ala Val Pro
 115 120 125
 ttc tac ggc tgc gtc aac tgg acc aat gag aac ttt ccc ttc aat gat 432
 Phe Tyr Gly Cys Val Asn Trp Thr Asn Glu Asn Phe Pro Phe Asn Asp
 130 135 140
 tgc gtc gac aag atg gtg atc tgg tgg gag gag ggc aag atg acg gcc 480
 Cys Val Asp Lys Met Val Ile Trp Trp Glu Glu Gly Lys Met Thr Ala
 145 150 155 160
 aag gtc gtg gag tcc gcc aag gcc att ctc ggc ggc agc aag gtg cgc 528
 Lys Val Val Glu Ser Ala Lys Ala Ile Leu Gly Gly Ser Lys Val Arg
 165 170 175
 gtg gac caa aag tgc aag tcg tcc gcc cag atc gac ccc acc ccc gtg 576
 Val Asp Gln Lys Cys Lys Ser Ser Ala Gln Ile Asp Pro Thr Pro Val
 180 185 190
 atc gtc acc tcc aac acc aac atg tgc gcc gtg att gac ggc aac agc 624
 Ile Val Thr Ser Asn Thr Asn Met Cys Ala Val Ile Asp Gly Asn Ser
 195 200 205
 acc acc ttc gag cac cag cag ccg ttg cag gac cgg atg ttc aaa ttt 672

Thr	Thr	Phe	Glu	His	Gln	Gln	Pro	Leu	Gln	Asp	Arg	Met	Phe	Lys	Phe		
210						215					220						
gaa ctc acc cgc cgt ctg gag cat gac ttt ggc aag gtg aca aag cag																	720
Glu	Leu	Thr	Arg	Arg	Leu	Glu	His	Asp	Phe	Gly	Lys	Val	Thr	Lys	Gln		
225					230					235					240		
gaa gtc aaa gag ttc ttc cgc tgg gcg cag gat cac gtg acc gag gtg																	768
Glu	Val	Lys	Glu	Phe	Phe	Arg	Trp	Ala	Gln	Asp	His	Val	Thr	Glu	Val		
				245					250					255			
gcg cat gag ttc tac gtc aga aag ggt gga gcc aac aaa aga ccc gcc																	816
Ala	His	Glu	Phe	Tyr	Val	Arg	Lys	Gly	Gly	Ala	Asn	Lys	Arg	Pro	Ala		
			260					265					270				
ccc gat gac gcg gat aaa agc gag ccc aag cgg gcc tgc ccc tca gtc																	864
Pro	Asp	Asp	Ala	Asp	Lys	Ser	Glu	Pro	Lys	Arg	Ala	Cys	Pro	Ser	Val		
		275					280					285					
gcg gat cca tcg acg tca gac gcg gaa gga gct ccg gtg gac ttt gcc																	912
Ala	Asp	Pro	Ser	Thr	Ser	Asp	Ala	Glu	Gly	Ala	Pro	Val	Asp	Phe	Ala		
		290				295					300						
gac agg tat ggc tgc cga tgg tta tct tcc aga ttg gct cga gga caa																	960
Asp	Arg	Tyr	Gly	Cys	Arg	Trp	Leu	Ser	Ser	Arg	Leu	Ala	Arg	Gly	Gln		
305					310					315					320		
cct ctc tga																	969
Pro Leu																	

<210> 11
 <211> 322
 <212> PRT
 <213> AAV-1

 <220>
 <221> misc feature
 <222> (943)..(944)
 <223> minor splice site

<400> 11
 Met Glu Leu Val Gly Trp Leu Val Asp Arg Gly Ile Thr Ser Glu Lys
 1 5 10 15

 Gln Trp Ile Gln Glu Asp Gln Ala Ser Tyr Ile Ser Phe Asn Ala Ala
 20 25 30

 Ser Asn Ser Arg Ser Gln Ile Lys Ala Ala Leu Asp Asn Ala Gly Lys
 35 40 45

 Ile Met Ala Leu Thr Lys Ser Ala Pro Asp Tyr Leu Val Gly Pro Ala
 50 55 60

 Pro Pro Ala Asp Ile Lys Thr Asn Arg Ile Tyr Arg Ile Leu Glu Leu
 65 70 75 80

 Asn Gly Tyr Glu Pro Ala Tyr Ala Gly Ser Val Phe Leu Gly Trp Ala
 85 90 95

Gln Lys Arg Phe Gly Lys Arg Asn Thr Ile Trp Leu Phe Gly Pro Ala
 100 105 110
 Thr Thr Gly Lys Thr Asn Ile Ala Glu Ala Ile Ala His Ala Val Pro
 115 120 125
 Phe Tyr Gly Cys Val Asn Trp Thr Asn Glu Asn Phe Pro Phe Asn Asp
 130 135 140
 Cys Val Asp Lys Met Val Ile Trp Trp Glu Glu Gly Lys Met Thr Ala
 145 150 155 160
 Lys Val Val Glu Ser Ala Lys Ala Ile Leu Gly Gly Ser Lys Val Arg
 165 170 175
 Val Asp Gln Lys Cys Lys Ser Ser Ala Gln Ile Asp Pro Thr Pro Val
 180 185 190
 Ile Val Thr Ser Asn Thr Asn Met Cys Ala Val Ile Asp Gly Asn Ser
 195 200 205
 Thr Thr Phe Glu His Gln Gln Pro Leu Gln Asp Arg Met Phe Lys Phe
 210 215 220
 Glu Leu Thr Arg Arg Leu Glu His Asp Phe Gly Lys Val Thr Lys Gln
 225 230 235 240
 Glu Val Lys Glu Phe Phe Arg Trp Ala Gln Asp His Val Thr Glu Val
 245 250 255
 Ala His Glu Phe Tyr Val Arg Lys Gly Gly Ala Asn Lys Arg Pro Ala
 260 265 270
 Pro Asp Asp Ala Asp Lys Ser Glu Pro Lys Arg Ala Cys Pro Ser Val
 275 280 285
 Ala Asp Pro Ser Thr Ser Asp Ala Glu Gly Ala Pro Val Asp Phe Ala
 290 295 300
 Asp Arg Tyr Gly Cys Arg Trp Leu Ser Ser Arg Leu Ala Arg Gly Gln
 305 310 315 320
 Pro Leu

<210> 12
 <211> 2211
 <212> DNA
 <213> AAV-1

<220>
 <221> CDS
 <222> (1)..(2208)
 <223>

<400> 12
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 Met Ala Ala Asp Gly Tyr Leu Pro Asp Trp Leu Glu Asp Asn Leu Ser

1	5	10	15	
gag ggc att cgc gag tgg tgg gac ttg aaa cct gga gcc ccg aag ccc Glu Gly Ile Arg Glu Trp Trp Asp Leu Lys Pro Gly Ala Pro Lys Pro 20 25 30				96
aaa gcc aac cag caa aag cag gac gac ggc cgg ggt ctg gtg ctt cct Lys Ala Asn Gln Gln Lys Gln Asp Asp Gly Arg Gly Leu Val Leu Pro 35 40 45				144
ggc tac aag tac ctc gga ccc ttc aac gga ctc gac aag ggg gag ccc Gly Tyr Lys Tyr Leu Gly Pro Phe Asn Gly Leu Asp Lys Gly Glu Pro 50 55 60				192
gtc aac gcg gcg gac gca gcg gcc ctc gag cac gac aag gcc tac gac Val Asn Ala Ala Asp Ala Ala Leu Glu His Asp Lys Ala Tyr Asp 65 70 75 80				240
cag cag ctc aaa gcg ggt gac aat ccg tac ctg cgg tat aac cac gcc Gln Gln Leu Lys Ala Gly Asp Asn Pro Tyr Leu Arg Tyr Asn His Ala 85 90 95				288
gac gcc gag ttt cag gag cgt ctg caa gaa gat acg tct ttt ggg ggc Asp Ala Glu Phe Gln Glu Arg Leu Gln Glu Asp Thr Ser Phe Gly Gly 100 105 110				336
aac ctc ggg cga gca gtc ttc cag gcc aag aag cgg gtt ctc gaa cct Asn Leu Gly Arg Ala Val Phe Gln Ala Lys Lys Arg Val Leu Glu Pro 115 120 125				384
ctc ggt ctg gtt gag gaa ggc gct aag acg gct cct gga aag aaa cgt Leu Gly Leu Val Glu Glu Gly Ala Lys Thr Ala Pro Gly Lys Lys Arg 130 135 140				432
ccg gta gag cag tcg cca caa gag cca gac tcc tcc tcg ggc atc ggc Pro Val Glu Gln Ser Pro Gln Glu Pro Asp Ser Ser Ser Gly Ile Gly 145 150 155 160				480
aag aca ggc cag cag ccc gct aaa aag aga ctc aat ttt ggt cag act Lys Thr Gly Gln Gln Pro Ala Lys Lys Arg Leu Asn Phe Gly Gln Thr 165 170 175				528
ggc gac tca gag tca gtc ccc gat cca caa cct ctc gga gaa cct cca Gly Asp Ser Glu Ser Val Pro Asp Pro Gln Pro Leu Gly Glu Pro Pro 180 185 190				576
gca acc ccc gct gct gtg gga cct act aca atg gct tca ggc ggt ggc Ala Thr Pro Ala Ala Val Gly Pro Thr Thr Met Ala Ser Gly Gly Gly 195 200 205				624
gca cca atg gca gac aat aac gaa ggc gcc gac gga gtg ggt aat gcc Ala Pro Met Ala Asp Asn Asn Glu Gly Ala Asp Gly Val Gly Asn Ala 210 215 220				672
tca gga aat tgg cat tgc gat tcc aca tgg ctg ggc gac aga gtc atc Ser Gly Asn Trp His Cys Asp Ser Thr Trp Leu Gly Asp Arg Val Ile 225 230 235 240				720
acc acc agc acc cgc acc tgg gcc ttg ccc acc tac aat aac cac ctc Thr Thr Ser Thr Arg Thr Trp Ala Leu Pro Thr Tyr Asn Asn His Leu				768

245										250					255					
tac	aag	caa	atc	tcc	agt	gct	tca	acg	ggg	gcc	agc	aac	gac	aac	cac	816				
Tyr	Lys	Gln	Ile	Ser	Ser	Ala	Ser	Thr	Gly	Ala	Ser	Asn	Asp	Asn	His					
			260					265					270							
tac	ttc	ggc	tac	agc	acc	ccc	tgg	ggg	tat	ttt	gat	ttc	aac	aga	ttc	864				
Tyr	Phe	Gly	Tyr	Ser	Thr	Pro	Trp	Gly	Tyr	Phe	Asp	Phe	Asn	Arg	Phe					
		275					280					285								
cac	tgc	cac	ttt	tca	cca	cgt	gac	tgg	cag	cga	ctc	atc	aac	aac	aat	912				
His	Cys	His	Phe	Ser	Pro	Arg	Asp	Trp	Gln	Arg	Leu	Ile	Asn	Asn	Asn					
	290					295					300									
tgg	gga	ttc	cgg	ccc	aag	aga	ctc	aac	ttc	aaa	ctc	ttc	aac	atc	caa	960				
Trp	Gly	Phe	Arg	Pro	Lys	Arg	Leu	Asn	Phe	Lys	Leu	Phe	Asn	Ile	Gln					
305					310				315						320					
gtc	aag	gag	gtc	acg	acg	aat	gat	ggc	gtc	aca	acc	atc	gct	aat	aac	1008				
Val	Lys	Glu	Val	Thr	Thr	Asn	Asp	Gly	Val	Thr	Thr	Ile	Ala	Asn	Asn					
				325					330					335						
ctt	acc	agc	acg	gtt	caa	gtc	ttc	tcg	gac	tcg	gag	tac	cag	ctt	ccg	1056				
Leu	Thr	Ser	Thr	Val	Gln	Val	Phe	Ser	Asp	Ser	Glu	Tyr	Gln	Leu	Pro					
			340					345					350							
tac	gtc	ctc	ggc	tct	gcg	cac	cag	ggc	tgc	ctc	cct	ccg	ttc	ccg	gcg	1104				
Tyr	Val	Leu	Gly	Ser	Ala	His	Gln	Gly	Cys	Leu	Pro	Pro	Phe	Pro	Ala					
		355					360					365								
gac	gtg	ttc	atg	att	ccg	caa	tac	ggc	tac	ctg	acg	ctc	aac	aat	ggc	1152				
Asp	Val	Phe	Met	Ile	Pro	Gln	Tyr	Gly	Tyr	Leu	Thr	Leu	Asn	Asn	Gly					
	370					375					380									
agc	caa	gcc	gtg	gga	cgt	tca	tcc	ttt	tac	tgc	ctg	gaa	tat	ttc	cct	1200				
Ser	Gln	Ala	Val	Gly	Arg	Ser	Ser	Phe	Tyr	Cys	Leu	Glu	Tyr	Phe	Pro					
385					390					395					400					
tct	cag	atg	ctg	aga	acg	ggc	aac	aac	ttt	acc	ttc	agc	tac	acc	ttt	1248				
Ser	Gln	Met	Leu	Arg	Thr	Gly	Asn	Asn	Phe	Thr	Phe	Ser	Tyr	Thr	Phe					
				405				410						415						
gag	gaa	gtg	cct	ttc	cac	agc	agc	tac	gcg	cac	agc	cag	agc	ctg	gac	1296				
Glu	Glu	Val	Pro	Phe	His	Ser	Ser	Tyr	Ala	His	Ser	Gln	Ser	Leu	Asp					
			420					425				430								
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Arg	Leu	Met	Asn	Pro	Leu	Ile	Asp	Gln	Tyr	Leu	Tyr	Tyr	Leu	Asn	Arg					
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act	caa	aat	cag	tcc	gga	agt	gcc	caa	aac	aag	gac	ttg	ctg	ttt	agc	1392				
Thr	Gln	Asn	Gln	Ser	Gly	Ser	Ala	Gln	Asn	Lys	Asp	Leu	Leu	Phe	Ser					
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Arg	Gly	Ser	Pro	Ala	Gly	Met	Ser	Val	Gln	Pro	Lys	Asn	Trp	Leu	Pro					
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Gly	Pro	Cys	Tyr	Arg	Gln	Gln	Arg	Val	Ser	Lys	Thr	Lys	Thr	Asp	Asn					

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Gly	Arg	Glu	Ser	Ile	Ile	Asn	Pro	Gly	Thr	Ala	Met	Ala	Ser	His	Lys					
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gac	gac	gaa	gac	aag	ttc	ttt	ccc	atg	agc	ggt	gtc	atg	att	ttt	gga	1632				
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Thr	Asp	Glu	Glu	Glu	Ile	Lys	Ala	Thr	Asn	Pro	Val	Ala	Thr	Glu	Arg					
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Phe	Gly	Thr	Val	Ala	Val	Asn	Phe	Gln	Ser	Ser	Ser	Thr	Asp	Pro	Ala					
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gat	aga	gac	gtg	tac	ctg	cag	ggt	ccc	att	tgg	gcc	aaa	att	cct	cac	1872				
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Tyr	Ala	Lys	Ser	Ala	Asn	Val	Asp	Phe	Thr	Val	Asp	Asn	Asn	Gly	Leu					
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tat	act	gag	cct	cgc	ccc	att	ggc	acc	cgt	tac	ctt	acc	cgt	ccc	ctg	2208				
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2211

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 35 40 45
 Gly Tyr Lys Tyr Leu Gly Pro Phe Asn Gly Leu Asp Lys Gly Glu Pro
 50 55 60
 Val Asn Ala Ala Asp Ala Ala Ala Leu Glu His Asp Lys Ala Tyr Asp
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 Gln Gln Leu Lys Ala Gly Asp Asn Pro Tyr Leu Arg Tyr Asn His Ala
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 Asp Ala Glu Phe Gln Glu Arg Leu Gln Glu Asp Thr Ser Phe Gly Gly
 100 105 110
 Asn Leu Gly Arg Ala Val Phe Gln Ala Lys Lys Arg Val Leu Glu Pro
 115 120 125
 Leu Gly Leu Val Glu Glu Gly Ala Lys Thr Ala Pro Gly Lys Lys Arg
 130 135 140
 Pro Val Glu Gln Ser Pro Gln Glu Pro Asp Ser Ser Ser Gly Ile Gly
 145 150 155 160
 Lys Thr Gly Gln Gln Pro Ala Lys Lys Arg Leu Asn Phe Gly Gln Thr
 165 170 175
 Gly Asp Ser Glu Ser Val Pro Asp Pro Gln Pro Leu Gly Glu Pro Pro
 180 185 190
 Ala Thr Pro Ala Ala Val Gly Pro Thr Thr Met Ala Ser Gly Gly Gly
 195 200 205
 Ala Pro Met Ala Asp Asn Asn Glu Gly Ala Asp Gly Val Gly Asn Ala
 210 215 220
 Ser Gly Asn Trp His Cys Asp Ser Thr Trp Leu Gly Asp Arg Val Ile
 225 230 235 240
 Thr Thr Ser Thr Arg Thr Trp Ala Leu Pro Thr Tyr Asn Asn His Leu
 245 250 255
 Tyr Lys Gln Ile Ser Ser Ala Ser Thr Gly Ala Ser Asn Asp Asn His

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Val	Lys	Glu	Val	Thr	Thr	Asn	Asp	Gly	Val	Thr	Thr	Ile	Ala	Asn	Asn
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Leu	Thr	Ser	Thr	Val	Gln	Val	Phe	Ser	Asp	Ser	Glu	Tyr	Gln	Leu	Pro
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Asp	Val	Phe	Met	Ile	Pro	Gln	Tyr	Gly	Tyr	Leu	Thr	Leu	Asn	Asn	Gly
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Ser	Gln	Met	Leu	Arg	Thr	Gly	Asn	Asn	Phe	Thr	Phe	Ser	Tyr	Thr	Phe
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Glu	Glu	Val	Pro	Phe	His	Ser	Ser	Tyr	Ala	His	Ser	Gln	Ser	Leu	Asp
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Asn	Asn	Ser	Asn	Phe	Thr	Trp	Thr	Gly	Ala	Ser	Lys	Tyr	Asn	Leu	Asn
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Lys	Glu	Ser	Ala	Gly	Ala	Ser	Asn	Thr	Ala	Leu	Asp	Asn	Val	Met	Ile
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Thr	Asp	Glu	Glu	Glu	Ile	Lys	Ala	Thr	Asn	Pro	Val	Ala	Thr	Glu	Arg
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Phe	Gly	Thr	Val	Ala	Val	Asn	Phe	Gln	Ser	Ser	Ser	Thr	Asp	Pro	Ala

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Thr	Gly	Asp	Val	His	Ala	Met	Gly	Ala	Leu	Pro	Gly	Met	Val	Trp	Gln						
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Asp	Arg	Asp	Val	Tyr	Leu	Gln	Gly	Pro	Ile	Trp	Ala	Lys	Ile	Pro	His						
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Thr	Asp	Gly	His	Phe	His	Pro	Ser	Pro	Leu	Met	Gly	Gly	Phe	Gly	Leu						
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Lys	Asn	Pro	Pro	Pro	Gln	Ile	Leu	Ile	Lys	Asn	Thr	Pro	Val	Pro	Ala						
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Asn	Pro	Pro	Ala	Glu	Phe	Ser	Ala	Thr	Lys	Phe	Ala	Ser	Phe	Ile	Thr						
			660					665					670								
Gln	Tyr	Ser	Thr	Gly	Gln	Val	Ser	Val	Glu	Ile	Glu	Trp	Glu	Leu	Gln						
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Lys	Glu	Asn	Ser	Lys	Arg	Trp	Asn	Pro	Glu	Val	Gln	Tyr	Thr	Ser	Asn						
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Tyr	Ala	Lys	Ser	Ala	Asn	Val	Asp	Phe	Thr	Val	Asp	Asn	Asn	Gly	Leu						
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Asp	Ser	Ser	Ser	Gly	Ile	Gly	Lys	Thr	Gly	Gln	Gln	Pro	Ala	Lys	Lys	
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aga ctc aat ttt ggt cag act ggc gac tca gag tca gtc ccc gat cca																144
Arg	Leu	Asn	Phe	Gly	Gln	Thr	Gly	Asp	Ser	Glu	Ser	Val	Pro	Asp	Pro	
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caa cct ctc gga gaa cct cca gca acc ccc gct gct gtg gga cct act																192
Gln	Pro	Leu	Gly	Glu	Pro	Pro	Ala	Thr	Pro	Ala	Ala	Val	Gly	Pro	Thr	
	50					55					60					
aca atg gct tca ggc ggt ggc gca cca atg gca gac aat aac gaa ggc																240
Thr	Met	Ala	Ser	Gly	Gly	Gly	Ala	Pro	Met	Ala	Asp	Asn	Asn	Glu	Gly	
	65				70				75					80		

gcc gac gga gtg ggt aat gcc tca gga aat tgg cat tgc gat tcc aca	288
Ala Asp Gly Val Gly Asn Ala Ser Gly Asn Trp His Cys Asp Ser Thr	
85 90 95	
tgg ctg ggc gac aga gtc atc acc acc agc acc cgc acc tgg gcc ttg	336
Trp Leu Gly Asp Arg Val Ile Thr Thr Ser Thr Arg Thr Trp Ala Leu	
100 105 110	
ccc acc tac aat aac cac ctc tac aag caa atc tcc agt gct tca acg	384
Pro Thr Tyr Asn Asn His Leu Tyr Lys Gln Ile Ser Ser Ala Ser Thr	
115 120 125	
ggg gcc agc aac gac aac cac tac ttc ggc tac agc acc ccc tgg ggg	432
Gly Ala Ser Asn Asp Asn His Tyr Phe Gly Tyr Ser Thr Pro Trp Gly	
130 135 140	
tat ttt gat ttc aac aga ttc cac tgc cac ttt tca cca cgt gac tgg	480
Tyr Phe Asp Phe Asn Arg Phe His Cys His Phe Ser Pro Arg Asp Trp	
145 150 155 160	
cag cga ctc atc aac aac aat tgg gga ttc cgg ccc aag aga ctc aac	528
Gln Arg Leu Ile Asn Asn Asn Trp Gly Phe Arg Pro Lys Arg Leu Asn	
165 170 175	
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Phe Lys Leu Phe Asn Ile Gln Val Lys Glu Val Thr Thr Asn Asp Gly	
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Val Thr Thr Ile Ala Asn Asn Leu Thr Ser Thr Val Gln Val Phe Ser	
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gac tcg gag tac cag ctt ccg tac gtc ctc ggc tct gcg cac cag ggc	672
Asp Ser Glu Tyr Gln Leu Pro Tyr Val Leu Gly Ser Ala His Gln Gly	
210 215 220	
tgc ctc cct ccg ttc ccg gcg gac gtg ttc atg att ccg caa tac ggc	720
Cys Leu Pro Pro Phe Pro Ala Asp Val Phe Met Ile Pro Gln Tyr Gly	
225 230 235 240	
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Tyr Leu Thr Leu Asn Asn Gly Ser Gln Ala Val Gly Arg Ser Ser Phe	
245 250 255	
tac tgc ctg gaa tat ttc cct tct cag atg ctg aga acg ggc aac aac	816
Tyr Cys Leu Glu Tyr Phe Pro Ser Gln Met Leu Arg Thr Gly Asn Asn	
260 265 270	
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Phe Thr Phe Ser Tyr Thr Phe Glu Glu Val Pro Phe His Ser Ser Tyr	
275 280 285	
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Ala His Ser Gln Ser Leu Asp Arg Leu Met Asn Pro Leu Ile Asp Gln	
290 295 300	
tac ctg tat tac ctg aac aga act caa aat cag tcc gga agt gcc caa	960
Tyr Leu Tyr Tyr Leu Asn Arg Thr Gln Asn Gln Ser Gly Ser Ala Gln	
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aac cct gtg gcc acc gaa aga ttt ggg acc gtg gca gtc aat ttc cag Asn Pro Val Ala Thr Glu Arg Phe Gly Thr Val Ala Val Asn Phe Gln 435 440 445	1344
agc agc agc aca gac cct gcg acc gga gat gtg cat gct atg gga gca Ser Ser Ser Thr Asp Pro Ala Thr Gly Asp Val His Ala Met Gly Ala 450 455 460	1392
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ctt atg ggc ggc ttt gga ctc aag aac ccg cct cct cag atc ctc atc Leu Met Gly Gly Phe Gly Leu Lys Asn Pro Pro Pro Gln Ile Leu Ile 500 505 510	1536
aaa aac acg cct gtt cct gcg aat cct ccg gcg gag ttt tca gct aca Lys Asn Thr Pro Val Pro Ala Asn Pro Pro Ala Glu Phe Ser Ala Thr 515 520 525	1584
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gaa att gaa tgg gag ctg cag aaa gaa aac agc aag cgc tgg aat ccc Glu Ile Glu Trp Glu Leu Gln Lys Glu Asn Ser Lys Arg Trp Asn Pro 545 550 555 560	1680

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Thr	Val	Asp	Asn	Asn	Gly	Leu	Tyr	Thr	Glu	Pro	Arg	Pro	Ile	Gly	Thr	
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Arg	Tyr	Leu	Thr	Arg	Pro	Leu										
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Gln	Pro	Leu	Gly	Glu	Pro	Pro	Ala	Thr	Pro	Ala	Ala	Val	Gly	Pro	Thr		
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Thr	Met	Ala	Ser	Gly	Gly	Gly	Ala	Pro	Met	Ala	Asp	Asn	Asn	Glu	Gly		
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Trp	Leu	Gly	Asp	Arg	Val	Ile	Thr	Thr	Ser	Thr	Arg	Thr	Trp	Ala	Leu		
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Pro	Thr	Tyr	Asn	Asn	His	Leu	Tyr	Lys	Gln	Ile	Ser	Ser	Ala	Ser	Thr		
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Tyr	Phe	Asp	Phe	Asn	Arg	Phe	His	Cys	His	Phe	Ser	Pro	Arg	Asp	Trp		
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Gln	Arg	Leu	Ile	Asn	Asn	Asn	Trp	Gly	Phe	Arg	Pro	Lys	Arg	Leu	Asn		
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Phe	Lys	Leu	Phe	Asn	Ile	Gln	Val	Lys	Glu	Val	Thr	Thr	Asn	Asp	Gly		
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Val	Thr	Thr	Ile	Ala	Asn	Asn	Leu	Thr	Ser	Thr	Val	Gln	Val	Phe	Ser		
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Asp	Ser	Glu	Tyr	Gln	Leu	Pro	Tyr	Val	Leu	Gly	Ser	Ala	His	Gln	Gly		

210					215					220					
Cys	Leu	Pro	Pro	Phe	Pro	Ala	Asp	Val	Phe	Met	Ile	Pro	Gln	Tyr	Gly
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Tyr	Leu	Thr	Leu	Asn	Asn	Gly	Ser	Gln	Ala	Val	Gly	Arg	Ser	Ser	Phe
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Tyr	Cys	Leu	Glu	Tyr	Phe	Pro	Ser	Gln	Met	Leu	Arg	Thr	Gly	Asn	Asn
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Phe	Thr	Phe	Ser	Tyr	Thr	Phe	Glu	Glu	Val	Pro	Phe	His	Ser	Ser	Tyr
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Tyr	Leu	Tyr	Tyr	Leu	Asn	Arg	Thr	Gln	Asn	Gln	Ser	Gly	Ser	Ala	Gln
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Asn	Lys	Asp	Leu	Leu	Phe	Ser	Arg	Gly	Ser	Pro	Ala	Gly	Met	Ser	Val
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Gln	Pro	Lys	Asn	Trp	Leu	Pro	Gly	Pro	Cys	Tyr	Arg	Gln	Gln	Arg	Val
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Ser	Lys	Thr	Lys	Thr	Asp	Asn	Asn	Asn	Ser	Asn	Phe	Thr	Trp	Thr	Gly
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Thr	Ala	Met	Ala	Ser	His	Lys	Asp	Asp	Glu	Asp	Lys	Phe	Phe	Pro	Met
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Ser	Gly	Val	Met	Ile	Phe	Gly	Lys	Glu	Ser	Ala	Gly	Ala	Ser	Asn	Thr
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						455					460				
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Ile	Trp	Ala	Lys	Ile	Pro	His	Thr	Asp	Gly	His	Phe	His	Pro	Ser	Pro
				485					490				495		
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			500					505					510		
Lys	Asn	Thr	Pro	Val	Pro	Ala	Asn	Pro	Pro	Ala	Glu	Phe	Ser	Ala	Thr
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 35 40 45
 Thr Tyr Asn Asn His Leu Tyr Lys Gln Ile Ser Ser Ala Ser Thr Gly
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Ala	Ser	Asn	Asp	Asn	His	Tyr	Phe	Gly	Tyr	Ser	Thr	Pro	Trp	Gly	Tyr	65	70	75	80
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Cys	Leu	Glu	Tyr	Phe	Pro	Ser	Gln	Met	Leu	Arg	Thr	Gly	Asn	Asn	Phe	195	200	205	
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Pro	Val	Ala	Thr	Glu	Arg	Phe	Gly	Thr	Val	Ala	Val	Asn	Phe	Gln	Ser	370	375	380	

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